



Phytochemicals of Brassicaceae in plant protection and human health--Influences of climate, environment and agronomic practice

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Abstract:

In this review, we provide an overview of the role of glucosinolates and other phytochemical compounds present in the Brassicaceae in relation to plant protection and human health. Current knowledge of the factors that influence phytochemical content and profile in the Brassicaceae is also summarized and multi-factorial approaches are briefly discussed. Variation in agronomic conditions (plant species, cultivar, developmental stage, plant organ, plant competition, fertilization, pH), season, climatic factors, water availability, light (intensity, quality, duration) and CO₂ are known to significantly affect content and profile of phytochemicals. Phytochemicals such as the glucosinolates and leaf surface waxes play an important role in interactions with pests and pathogens. Factors that affect production of phytochemicals are important when designing plant protection strategies that exploit these compounds to minimize crop damage caused by plant pests and pathogens. Brassicaceous plants are consumed increasingly for possible health benefits, for example, glucosinolate-derived effects on degenerative diseases such as cancer, cardiovascular and neurodegenerative diseases. Thus, factors influencing phytochemical content and profile in the production of brassicaceous plants are worth considering both for plant and human health. Even though it is known that factors that influence phytochemical content and profile may interact, studies of plant compounds were, until recently, restricted by methods allowing only a reductionistic approach. It is now possible to design multi-factorial experiments that simulate their combined effects. This will provide important information to ecologists, plant breeders and agronomists.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Food/Water Security

Food/Water Security: Agricultural Productivity

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Climate Change and Human Health Literature Portal

Geographic Location:

resource focuses on specific location

Global or Unspecified

Health Impact:

specification of health effect or disease related to climate change exposure

General Health Impact

Resource Type:

format or standard characteristic of resource

Review

Timescale:

time period studied

Time Scale Unspecified